

WHAT IS CLAIMED IS:

1. A magnetic storage element, comprising:

5 a storage layer for holding a magnetization state as information, a non-magnetic layer and a pinned layer in which a direction of the magnetization is fixed, which are stacked, wherein:

said storage layer is composed of a first magnetic layer mainly composed of a transition metal and  
10 a second magnetic layer mainly composed of a rare-earth metal which are directly stacked, and

a magnetization amount of said first magnetic layer is smaller than that of said second magnetic layer at a room temperature.

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2. The magnetic storage element as claimed in Claim 1, wherein said first magnetic layer among said first and second magnetic layers constituting said storage layer is disposed closer to said pinned layer.

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3. A recording method on a magnetic storage element, using a magnetic storage element comprising: a storage layer for holding a magnetization state as information, a non-magnetic layer and a pinned layer in which a  
25 direction of the magnetization is fixed, which are stacked, wherein: said storage layer is composed of a first magnetic layer mainly composed of a transition metal and a second magnetic layer mainly composed of a rare-earth metal which are directly stacked, and a  
30 magnetization amount of said first magnetic layer is smaller than that of said second magnetic layer at a room

temperature, said method comprising the steps of:

heating said storage layer and applying a magnetic layer to the storage layer to record a magnetization state having one direction on the storage layer, and

5 heating said storage layer to have a magnetic coupling work on said first magnetic layer and said pinned layer so as to record a magnetization state having the other direction on the storage layer.

10 4. A magnetic storage device comprising:

a magnetic storage element comprising a storage layer for holding a magnetization state as information, a non-magnetic layer and a pinned layer in which a direction of the magnetization is fixed, which are  
15 stacked, said storage layer is composed of a first magnetic layer mainly composed of a transition metal and a second magnetic layer mainly composed of a rare-earth metal which are directly stacked; in which a magnetization amount of said first magnetic layer is  
20 smaller than that of said second magnetic layer at a room temperature;

a reader for reading out a relative magnetization between said storage layer and said pinned layer depending on a change of an electrical resistance;

25 a wiring for applying a current induced magnetic field having one direction to said storage layer; and  
a heater for heating said storage layer.

5. The magnetic storage device as claimed in claim 4,  
30 wherein: said wiring is electrically connected to said storage layer and also serves as said heater.

6. The magnetic storage device as claimed in claim 5,  
wherein: a second wiring is provided to said magnetic  
storage element in addition to said wiring, and said  
5 heater comprises the wiring and the second wiring.